ET-98 May 1937

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine

A SMALL THERMO-REGULATED WATER BATH HEATER

By Loyal H. Davis[1] and E. M. Livingstone,
Division of Truck Crop and Garden Insect Investigations

In the course of experiments on the toxicity of hydrocyanic acid gas to the larva of the cigarette beetle it was necessary to secure accurate control of the temperature in the fumatoria. This was accomplished by means of a constant-temperature water bath in which the fumatoria were immersed.

The heating unit herein described and illustrated does not differ in general principle from those commonly used for maintaining a constant water-bath temperature. It has been compactly and simply constructed, however, and may be built economically in a field laboratory.

The apparatus is made up of a thermo-regulator, a heater-type electric bulb, and a stirrer operated by a small electric motor. The parts were mounted on a portable framework of wood. The thermo-regulator, purchased from a manufacturer of scientific instruments for $10, was easily adjusted for any desired temperature. In order to prevent the current from arcking between its contact points a small condenser was attached. The heater-type electric bulb was purchased from a therapeutic supply store and cost approximately $1. A small toy electric motor, costing $1.50, was used to operate the stirrer. This type of motor took up small space, produced so little vibration that the contact points of the thermostat were not affected, and gave a long period of service. The stirrer was made of glass tubing 8 mm. in diameter. One end was connected to the motor drive by means of a short piece of noncollapsible rubber tubing, no screws being used. The end of the stirrer extending into the water was sealed, and for a distance of 1¼ inches from the end was flattened and bent propeller-wise in order to produce the stirring effect. As shown in figure 1, the unit was wired so that the stirrer ran continuously while the heater-type bulb operated through the thermo-regulator. By the use of this apparatus a constant temperature of 82° F. ± 0.25 was maintained in a bath containing 7 gallons of water.

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[1] Formerly field aide.

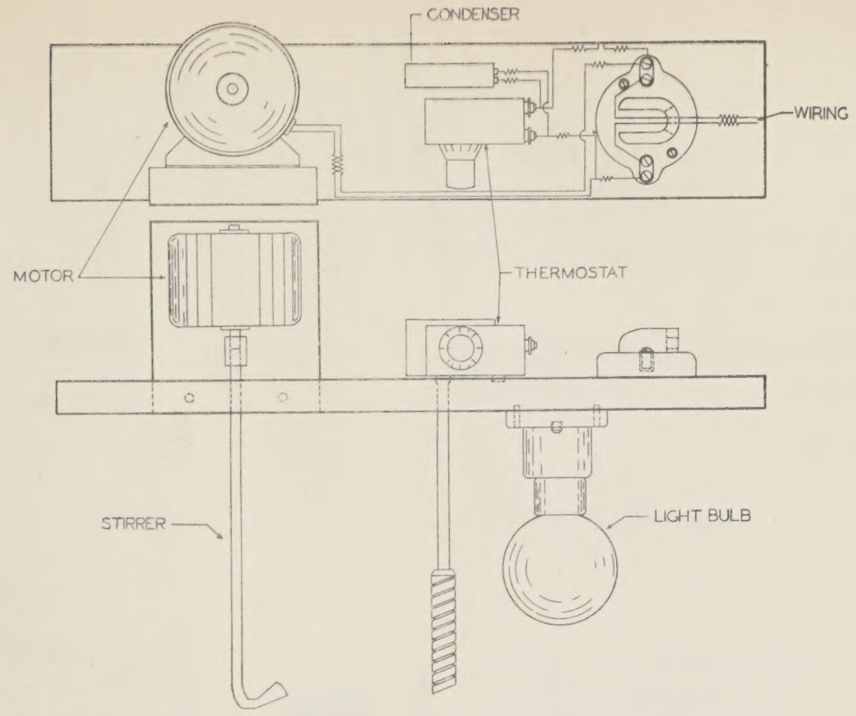

Figure 1.--Working diagram of small thermo-regulator, top and side views, showing construction of heating unit.

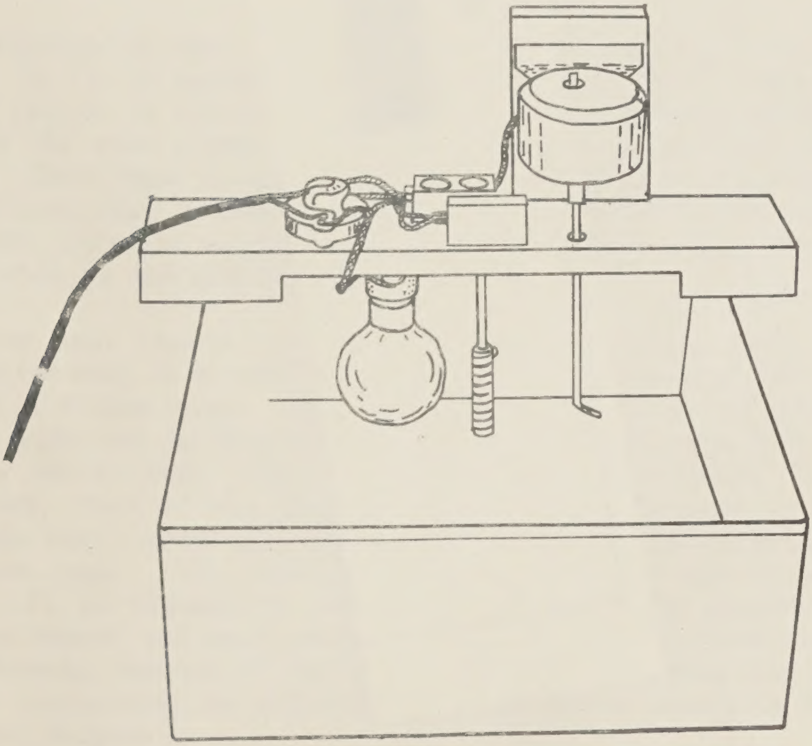

Figure 2.--Outline sketch of thermo-regulated heating unit, showing relative size of bath, motor, stirrer, condenser, and connections.